
BENEFICIAL USE RECONNAISSANCE PROJECT

**QA/QC MANUAL
FOR FIELD DATA SHEETS
ON WADABLE STREAMS
1999**

IDAHO DIVISION OF ENVIRONMENT QUALITY

1999

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Introduction

The Beneficial Use Reconnaissance Project is founded on methods and protocols, found in the 1999 BURP Workplan (Beneficial Use Reconnaissance Project Technical Advisory Committee 1999), where a set procedure is used for sampling each stream, thus creating results useful for comparison and/or study on a statewide basis. This protocol has been organized on to 6 pages of forms. Once the data has been collected, a copy is made and is sent to the State Office. At this point it is the job of the QA person to critically review the forms, recognize the possible mistakes, and take the necessary steps to make corrections. Quality Assurance/Quality Control is critical to each step of our monitoring process. This document covers the portion of our monitoring as it relates to field data forms.

1

Auditing Field Forms

Field Form Page 1:

Stream Name:

- Required
- Spelling must be EXACTLY consistent with the GNIS (Geographic Names Index System) (U.S. Geological Survey 1995). No abbreviations are allowed. The database will accept up to 50 characters for this field.
- Check the latitude and longitude readings, name of the quad map on the field form and the county against the stream name in question when you are verifying correct stream name spelling. This will indicate that you are referencing the correct stream.
- Be aware of similar spellings such as “Tenmile Creek” and “Ten Mile Creek” which are both different and shouldn’t be written as “10 mile Creek.” Also note how a stream name is organized. “Middle Fork Boise River” is not the same as “Boise River, Middle Fork.”
- If a site is described as an “upper” or “lower” site on a stream, the words “upper” or “lower” should be in parentheses after the stream name. For example: Middle Fork Boise River (upper)

Site ID:

- Required
- For data handling purposes, make sure it is on every page.
- Must be 12 digits with the following structure:

Present year	(4 digits)	1999
Waterbody type	(1 digit)	S (for “stream”)
Regional Office Abbreviation	(3 digits)	(CDA - Coeur d’Alene) (LEW - Lewiston) (BOI - Boise) (TWF - Twin Falls) (POC - Pocatello) (IDF - Idaho Falls)
Crew	(1 digit)	A, B, C, or D
Site Number	(3 digits)	example: 001, 045, 165
- Example of Site ID for Boise “A” crew, site 34: 1999SBOIA034
- A site ID is unique to that site. If a stream is BURPED twice both sites should have different site ID’s and the stream name on the forms should have an “(upper)” and “(lower)” labeling.

Date:

- Required
- The form used is: Year/Month/Day (YY/MM/DD)
- The date should be six digits long. “99/6/3” is not correct. In cases such as these, add the zeros to make it “99/06/03”.

Hydrologic Unit Code (HUC):

- Required
- Must be eight digits. For example: 17050123
- Also called “fourth field HUC” or “fourth field cataloging unit”

PNRS:

- Optional
- Acronym for Pacific Northwest River Study. A Government study that described segments of streams and rivers to give them specific numbers.
- PNRS has the form: NNNN.NN. For example: 0152.65

WB ID No.:

- Optional
- A number assigned by DEQ to a segment of a waterbody within a HUC which has deemed to have the same beneficial uses. The number is numerical identification to be used in the standards.
- The numbers range from one to three digits, no decimals, following the HUC number. For example, 17060207-009 references the Chamber Basin.

Public Land Survey:

- Required
- To describe a 1/64th of a section, the correct method is:
Township, Range, Section, 1/64th section, 1/16th section, 1/4 section
For example:
T04N, R03E, Sec. 23, SW1/4, SE1/4, NE1/4
- To describe a location in a section, use the “Official DEQ PLSS Locator Template”

For section:	Use template called:
1 - 5	“A Tall Section”
7, 18, 19, 30, 31	“A Wide Section”
6	“A Tall and Wide Section”
All other sections	“A Normal Section”
- See Appendix A

Longitude/Latitude, Datum, and Lat/Long Confidence:

- Required
- The first step in checking latitude and longitude is to make sure the right datum and lat/long confidence has been selected. If the crew used corrected GPS data, NAD27 should be checked along with 2-5 meters. If the crew used uncorrected GPS data, NAD27 should be checked along with 100 meters. If the crew used a map, NAD 27 should be checked along with 500 meters (estimate).
- Check with Regional Office if coordinates listed on field form do not fall within the bounds listed in the GNIS index.

County:

- Required

Ecoregion:

- Required
- Usually the crews are right, but if something does not look correct, such as a the Northern Rockies Ecoregion at a site in the Owyhee Mountains, double check it. The crews are told to determine the ecoregion by what they see at a site, not necessarily what the map might indicate for a particular location. At boundaries of ecoregions an overlapping effect can occur, or “fingers” of one ecoregion can protrude into adjacent ecoregions.
- The full ecoregion name must be used: “Snake River Basin/High Desert” not “Snake River”.
- If an error is suspected, debatch and have the regional office make re-evaluate.

Map Elevation:

- Required
- Make sure units match measurement. 400 feet elevation and 4500 meters are most likely errors.

Location Relative to Landmark:

- Required
- Ask yourself: “Could a person new to the area find this site without any trouble?”
- Description must be relative to a permanent structure or point on the ground.
- Do not use information that is only found on a map such as section lines, contour lines, or county lines. Do not use vague information like “bend in road”.
- Good locations are mountain peaks with names, road intersections, road mile markers, stream confluences, power lines, small towns, waterfalls, islands, campgrounds, etc.
- Include all Forest Service Road numbers.

Weather Conditions:

- Required

- Three categories of weather are to be considered; cloud cover, intensity of rain, and amount of wind.

- Weather is to be described with the following words:

<u>Temperature</u>	<u>Cloud Cover</u>	<u>Intensity of Rain</u>	<u>Amount of Wind</u>
hot	Foggy	Misty	Thunderstorms
cold	Partly cloudy	Light Rain	Breezy
warm	Mostly cloudy	Raining	Light wind
cool	Cloudy	Hard Rain/Downpour	Windy
	Clear		Very Windy
	Sunny		

Crew Members:

- Required
- Format to be used is “First Initial, Last Name”. For example: J. Smith.

General Wetted Width:

- Required
- This is a preliminary estimate (in meters) to give the crews an idea of how long their sample site is going to be.
- If the crew has mistakenly used a “<or>” sign, find exact measurement referring to the width/depth ratio chart (page 5) and take the average of all 3 transects’ wetted width measurements.

Total Reach Length:

- Required
- Must be at least 100m if stream is less than or equal to 2.5 meters wide.
- Must be 40 times the width if stream is more than 2.5 meters wide.
- This number will not always match the Longitudinal Habitat Distribution total on page 6. Though the numbers are a description of the length of the stream, the measurement methods for both are different. It is not incorrect if the crew lists the LHD total here, but the QA person does not need to correct if an estimate is given.

Stream Order:

- Required
- See Appendix B, “Guide to Stream Order Classification”
- One of the numbers should be circled; QA personnel should double check it.
- Stream order describes the size of a stream. Using a 1:100K USGS map, start at the headwaters and count the tributaries that make up the stream/river at hand. Do this until you’ve reached the BURP site. Only count perennial streams (no ephemeral or intermittent streams: marked by a broken blue line on the map). When a first order (headwater) stream joins with another, it becomes a second order stream. Two second order streams together become a third order stream, and so forth. However, when a first

If a lower numbered stream joins with a higher numbered stream, the higher number remains at the original higher order. This is because the amount of flow entering the third order stream from the second order (for example) probably won't increase the third order stream by much. On site, though, the crew may see that the tributary is as big as the main stem. This call can only be made in the field, so check with the crew when in doubt.

- See Appendix B

Stream Gradient:

- Required
- Determined in the field with the aid of a clinometer, but can also be derived/double checked in the office by dividing the known elevation change between two points on a stream by the stream (or thalweg) distance between those two points
- Number is usually less than three. If it is large, (greater than 4°), Double check the topographic map to see if reach occurs in an area of high relief.

Rosgen Stream Type:

- Required
- (Rosgen 1996)
- Classify to Level I only.

Water Temperature:

- Required
- Units are necessary. Temperature must be in degrees Celsius; convert if not.

Time:

- Required
- 24 hour time must be used. For example 3:30pm would be 1530 hours.

Amphibians and Fish Observed:

- Optional.
- Check spelling,

Valley Type:

- Required
- Only one should be circled.

Sinuosity:

- Required
- Only one should be circled.

Activities Affecting Reach:

- Required
- Circle all that apply.
- Briefly scan “Additional Comments” to see if there’s mention of more activities that weren’t marked.

Additional Information:

- Optional
- Check for spelling and legibility.

Field Form Page 2

- Optional
- This page is for comments from the crew about anything unusual they might have found or seen, and to describe the area of the site: vegetation types, animal tracks, human activity, etc.
- Check for spelling and legibility,

Field Form Page 3

Discharge Measurement:

- Required
- Calculate discharge according to the methods given in Harrelson et al, 1993. The final value should be entered onto the form and rounded to the nearest tenth of a decimal.
- Due to computer rounding and a slightly different program than the Regional Offices might have, minute changes to CFS measurements are not significant.
- When to tell Regional Offices about Discharge Measurement changes:
 - If State Office total is significantly different (1 - 2 CFS) than their total.
 - If State Office total is <5 and their total is >5, or vice versa.
- If the stream’s depth is greater than 2.5, there should be two separate columns of velocity data because the stream’s velocity should have been sampled at two different depths.

Macroinvertebrate Samples:

- Required
- Were samples taken during low/stable flow? “Yes” or “No” must be circled.
- Sample Number:
 - Each of the following are required for all three transects:
 - Label: T-1, T-2, and T-3
 - Sampler Used: Hess, Surber, or Kick must be circled.

Habitat Sampled: Riffle, Run, Glide, or Pool must be circled.

Time: 24 hour time must be used.

By: Must have first initial and last name of person who collected the data.

Field Form Page 4:

Wolman Pebble Count:

- Required
- A minimum of fifty counts should have been taken at each transect, for a total of 150.
- Each box should have a LEGIBLE total and hashmarks to indicate the total. Double check the tallies for each box.
- The lines labeled “subtotal” and “total” should be blacked out with a marker. These totals are used solely for the field crew as a guide to help them get a tally of at least fifty for each transect. The BURP application used for this information only uses the raw data from this page.
- Comments such as “all silt” and “all sand” are unacceptable, as are just writing “50” in one of the boxes. Verify with BURP coordinator for region for explanation.
- It is also unacceptable if the crew writes in numbers without any tally marks.

Large Woody Debris:

- Required.
- A zero should be entered if no LWD present in stream.

Canopy Closure:

- Required
- All boxes must have a number entered.
- No number should be larger than 17.

Field Form Page 5:

Width/Depth Ratio:

- Required
- All boxes should have numbers entered in them.
- Bankfull Width must be larger than Wetted Width
- Based on what the Wetted Width is, there should be 3, 5, or 7 Wetted Depth measurements (see the small box at right of page 5 on field form).
- Average Wetted Depth is an average of the Wetted Depth Measurements. Double check with a calculator.

Photo Information:

- Required
- Roll name can be anything, usually something like "STWF01".
- Photo number and directional information (upstream, downstream) must be present for all photos taken.
- Azimuth is optional.

Field Form Page 6:

Longitudinal Habitat Distribution:

- Required
- All stream habitat types must have a total in the "total" space provided. If one or more of the habitats didn't exist within the reach, a "0" should be in the "total" space.
- Again, this total may be different from the Total Reach Length.

Streambank Condition:

- Required
- The left bank and right bank should both equal 100% independently.

Habitat Assessment Summary Sheet:

- Required
- The prevailing habitat must be circled (either riffle/run or glide/pool).
- The prevalence should match the dominant habitat type from the "Longitudinal Habitat Distribution" section. If it does not, reconcile with the regional office.
- Numbers must be entered only in the shaded boxes under the prevalence selected.
- Do not total the numbers at the bottom of the table.

Pool Quality Index:

- Required
- "Max Pool Depth" must be greater than "Tailed Depth".
- All measurements entered into the table must be actual numbers. Words such as "silt," "boulder," "all sand" are not acceptable. It is also unacceptable to enter ranges such as "<1mm" or ">254mm".
- Double check to see that the proper code was assigned. Data entry only inputs the raw data, however if the code the crew wrote doesn't match the raw data, it must be corrected.
- All numbers must be legible.

Map Page:

- Required

- Map requires five pieces of information:
 1. Stream Name
 2. Site ID
 3. Map Name
 4. Scale
 5. Site must be clearly labeled on the map with an arrow, X, etc.

2

Debatching Criteria

Field Forms cannot be entered into the database if any of the REQUIRED information is missing. State Office personnel are very limited in the assumptions they can make regarding missing information. Every effort should be made to resolve the missing information over the phone or via email. Forms will be QA'd faster and more efficiently this way. Debatching should be looked at as a last resort because it is so slow and inefficient. Photocopy all changes made and send to the regional office for record update and verification.

The following is a list of changes the **State Office Personnel** can make:

- Some stream name problems, especially ones corrected using the GNIS
- County (according to lat/long, map, and PLSS)
- Datum and Confidence
- Public Land Survey
- Elevation
- Discharge, if changes are minimal and do not change about the 5 cfs threshold
- Math errors
- Map name and scale
- Spelling errors
- Other obvious typo errors

The following is a partial list of errors for which the State Office crew cannot fix. Corrections must be made at the discretion of the **Regional Office**:

- Information cut off in copying, or copies illegible
- Unsolvable problems with map information and stream names
- Location descriptions that are too vague or missing altogether
- No date
- Missing crew members' names on front page or Macroinvertebrate samples
- Macroinvertebrate habitat and/or sampler type missing
- Pool Quality Index entries which aren't numbers
- Streambank conditions which don't total to exactly 100% for each bank
- Longitudinal Habitat Distribution isn't within ½ meter of the Reach Length on page one, or the total is less than 100m
- No roll name for photos taken
- Valley type or sinuosity not circled
- Rosgen Stream Type missing
- Empty boxes in Canopy Closure table

3

Procedures for Debatching and Rebatching Field Forms

Originals and Examples of each form mentioned below can be found in Chapter 4.

Debatching

If an error on a form by a field crew cannot be fixed by the QA/QC staff in the State Office, the form must be sent back to the region so the error can be fixed. The following is the process to be used when a form is debatched and sent back to the region for correction.

1. First, stamp the form to be debatched in the bottom right-hand corner of every page with the yellow D-stamp. The accompanying error sheet (used in the QA/QC process to list errors found on each form) should be stamped in the upper left-hand corner.
2. Fill out a white/yellow Debatch slip with the appropriate information. In the “Comments:” section, instructions need to be provided on how to fix the error(s). These should be written as if writing directly to a crew member.
3. Attach the white half of the Debatch slip to the error sheet and file in the Debatch file under the appropriate date. Attach the yellow half of the Debatch slip to the entire form and send it to the region.
4. On the field form tracking sheet and batch tracking sheet, enter the date the form was debatched and the date it was sent to the region in the appropriate columns.
5. File the error form with its attached white Debatch slip in the appropriate region’s file folder in the “Debatch” hanging file.

Rebatching

The following is the process used when a debatched form is corrected and is resubmitted by the region:

1. When the form returns from the region, it should still have the yellow slip attached to the D-stamped copies. On the field form tracking sheet and batch tracking sheet, note the date that the form was returned.
2. Find the corresponding white slip/error sheet which has been filed under the appropriate region in the “Debatch hanging file.
3. Detach the D-slips and throw away the yellow copy. Stamp the white copy with a DEQ “Received” stamp.
4. The form is ready to rebatch. Compile a batch-sized number of returned forms and log them into the log book as if they were a new batch (make a note on the batch tracking sheet that this batch contains rebatched forms).
5. Circle the stamped “D”’s (on the error sheet and forms) to signify that they have been rebatched.
6. Audit the forms as any other forms would be audited. If any form contains further errors that cannot be handled by the State Office, it may be debatched again, following the same procedure as above. If the form contains no errors, it may be sent to Data Processing with the batch.
7. File the error sheets and the white Debatch slips for the new batch in the regular error sheet folder for the appropriate region.

Note:

If changes are made to any form by the State Office, either before or after the form was sent back to the region, they must be photocopied, highlighted, and sent to the regions as they would be for any other form. Although the crew might have noted changes on the form when it was sent back to them, they may have only noticed the error mentioned on the debatch form and may be unaware of any other changes the State Office might have made.

IDAHO DEPARTMENT OF HEALTH & WELFARE
Division of Environmental Quality
Beneficial Use Reconnaissance Project
'D' SLIP

SITE # _____

EXTRACTED BY _____

FIELD FORMS _____ or

LAB ANALYSIS FORM _____

EXTRACTED FROM BATCH # _____

DATE EXTRACTED _____

COMMENTS: _____

*Please return 'D' stamped copies.

sc c: \burp\dslip.fm

IDAHO DEPARTMENT OF HEALTH & WELFARE
Division of Environmental Quality
Beneficial Use Reconnaissance Project
'D' SLIP

SITE # 1998STWFA027

EXTRACTED BY BE

FIELD FORMS X or

LAB ANALYSIS FORM _____

EXTRACTED FROM BATCH # FB27

DATE EXTRACTED 98-12-22

COMMENTS: Pg 5 - W/D Ratio: T3, The habitat type
sampled is not indicated.

RECEIVED

FEB 22 1999

*Please return 'D' stamped copies.

Div. of Environmental Quality
Community Programs

sc c: \burp\dslip.fm

4

Tracking Forms

This section contains examples of the forms generated for tracking the data for 1999. The titles and purposes of the forms are listed below, and the actual forms can be found on the following pages.

BURP Field Batch Tracking Sheet:	Tracks the field forms by batch number; also includes debatch information.
BURP Field Form Tracking Sheet:	Tracks the field forms by individual site ID; also includes debatching, packing slip, and correction information.
BURP Lab Analysis Tracking Sheet: forms	Tracks the macro/fish samples and lab analysis by batch number.
BURP Field Form Error/Note Sheet:	Lists the errors found on each form.
BURP Crew Information:	Used to compile information on the most common errors made by each crew; also used when writing memos to the crews to remind them of certain procedures.
Debatch Slip:	Comprised of two differently colored, but identical pieces of paper. One is attached to the returned field form and the other is kept in the State Office as a record.

Beneficial Use Reconnaissance Project
Field Form Batch Tracking Sheet
c:\BURPFORMS\FFBTS

Audited:

Sent to DP:

Rec'd from DP:

Batch #: _____

of forms: _____

[illegible]

c:\BURPFORMS\FFBTS

Batch #: FB02

of forms: 11

1

IDF

BENEFICIAL USE RECONNAISSANCE PROJECT FIELD FORMS
1999 Tracking Sheet

c:\burp97\FFTS

[illegible]

CDA

BENEFICIAL USE RECONNAISSANCE PROJECT FIELD FORMS
1999 Tracking Sheet

c:\burp97\FFTS

* SITE ID	FB	DEBATCH INFO				PACKING SLIP #			LAB BATCH #			COPIED CORR	SENT CORR	STREAM NAME/NOTES
		Deb'd	Sent	Rec'd	New FB	Bugs	Fish	Algae	Bugs	Fish	Algae			
1999SCDA0002	07													Little NF SF CDA River
1999SCDA0003	"													Stella Creek
1999SCDA0004	"													Beauty Creek
1999SCDA0005	"													Jordan Creek
1999SCDA0006	"													Deer Creek
1999SCDA0007	"													Emerson Creek
1999SCDA0008	"													Savage Creek
1999SCDA0009	"													Lightning Creek
1999SCDA0010	"													MF Boulder Creek
1999SCDA0011	09													Boundary Creek (upper)
1999SCDA0012	09													Boundary Creek (new lower)
1999SCDA0013	09													Boundary Creek (old lower)
1999SCDA0015	09													Upper West Branch Priest River (lower)
1999SCDA0016	09													Upper West Branch Priest River (m)
1999SCDA0017	07													Upper West Branch Priest River (u)
1999SCDA0018	07													Bottle Creek
1999SCDA0019	07													Hobo Creek
1999SCDA0020	07													Masquito Creek
														Timber Creek

c:\burp97\LABTS

of forms: _____ # of sites: _____

19

Beneficial Use Reconnaissance Project
Lab Analysis Batch Tracking Sheet

c:\burp97\LABTS

(F)

Batch #: LB 37 con.

of forms: 61

of sites: 61

SITE ID #	FB	DATE RECEIVED FROM LAB			DATE SENT TO LAB BY REGION			DATE RECEIVED BY LAB			DATE AUDIT	DATE SENT TO DP			DATE RECEIVED FROM DP		
		bugs	fish	algae	bugs	fish	algae	bugs	fish	algae		bugs	fish	algae	bugs	fish	algae
97EIROM141	44		97-11-18			97-10-20			97-11-13		97-12-17						
97EIROL057	17		97-11-18			97-10-20			97-11-13								
97EIROL058	17		97-11-18			97-10-20			97-11-13								
97EIROL071	26		97-11-18			97-10-20			97-11-13								
97EIROL073	26		97-11-18			97-10-20			97-11-13								
97EIROM015	03		97-11-18			97-10-20			97-11-13								
97EIROM014	03		97-11-18			97-10-20			97-11-13								
97EIROL014	02		97-11-18			97-10-20			97-11-13								
97EIROL015	02		97-11-18			97-10-20			97-11-13								
97EIROL013	02		97-11-18			97-10-20			97-11-13								
97EIROL016	02		97-11-18			97-10-20			97-11-13								
97EIROL063	17		97-11-18			97-10-20			97-11-13								
97EIROM004	/		97-11-18			97-10-20			97-11-13								
97EIROM068	25		97-11-18			97-10-20			97-11-13								
97EIROM067	25		97-11-18			97-10-20			97-11-13								
97EIROM0120	/		97-11-18			97-10-20			97-11-13								
97EIROM073	25		97-11-18			97-10-20			97-11-13		97-12-17						

(M)

Beneficial Use Reconnaissance Project
Lab Analysis Batch Tracking Sheet

c:\burp97\LABTS

Batch #: LB43

of forms: 17 # of sites: 17

SITE ID #	FB	DATE RECEIVED FROM LAB			DATE SENT TO LAB BY REGION			DATE RECEIVED BY LAB			DATE AUDIT	DATE SENT TO DP			DATE RECEIVED FROM DP		
		bugs	fish	algae	bugs	fish	algae	bugs	fish	algae		bugs	fish	algae	bugs	fish	algae
97EIROL045	17	97-12-31			97-8-14			97-8-14									
97EIROL047	17	97-12-31			97-8-14			97-8-14									
97EIROL049		97-12-31			97-8-14			97-8-14									
97EIROL053	17	97-12-31			97-8-14			97-8-14									
97EIROL059	17	97-12-31			97-8-14			97-8-14									
97EIROL060	17	97-12-31			97-8-14			97-8-14									
97EIROL072	26	97-12-31			97-8-14			97-8-14									
97EIROL074	26	97-12-31			97-8-14			97-8-14									
97EIROL075	46	97-12-31			97-8-14			97-8-14									
97EIROL079	46	97-12-31			97-8-14			97-8-14									
97EIROL080	26	97-12-31			97-8-14			97-8-14									
97EIROL081	46	97-12-31			97-8-14			97-8-14									
97EIROL092	26	97-12-31			97-8-14			97-8-14									
97EIROL100	26	97-12-31			97-8-14			97-8-14									
97EIROL102	46	97-12-31			97-8-14			97-8-14									
97EIROL108	29	97-12-31			97-10-20			97-10-20									
97EIROL123	44	97-12-31			97-10-20			97-10-20									

BURP Field Form Error/Note Sheet

Site ID: _____

Batch: FB_____

Date: _____

JR

MC

Page #:

Comment:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. On the left side, there is a vertical margin line, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

BURP Field Form Error/Note Sheet

Site ID: 1998SIDFA107 Batch: FB 23B Date: 98-12-9 (JR) BE

Page #: Comment:

1.	site ID
1	elevation missing
3	discharge miscalculations
6	PQ1 residual depth miscalculation
7	map scale absent

BURP Crew Information

Crew:

Forms _____ through _____

Date:

[illegible]

Comments:

Action:

Crew: 1998SCDA A

Forms 3 through 9

Date: 7/21/99

[illegible]

Comments:

missing forms #1, 2
copies too light

Action:

memo sent w/ deb'd forms - 7/24/98

5

Auditing Macroinvertebrate Data

The 1999 Macroinvertebrate data batches mark the beginning of a new process for entering data into the database. Hand transcription will no longer be used- all data will be electronically transferred between the identifying lab and the State Office. The majority of QA/QC will be provided by the contracting lab, making the process at the State Office significantly shorter. It should also be noted that 1998 Macroinvertebrate data is being entered according to the following procedures as well.

It is established that 10% of all sites will be Quality Assurance checked. The specific site IDs will be selected using a random number generator (available through Excel).

QA Procedure:

- Data processing personnel will notify BURP QA/QC staff when ready for conducting QA/QC of entered sites.
- Log on to BURP database, call up screen of specific site to be QA checked.
- Check all header information:
 - * County
 - * Site ID number
 - * Public Land Survey and quarter descriptions
 - * Collector's name and date collected
 - * Verify all lab header info is correct in database
- Locate the "Taxa Richness" number following the last entry.
- Count the actual number of taxa listed (NOT Order) and verify that the "Taxa Richness" corresponds to the actual number.
- Add all number of individuals listed from the Total No. column and verify that number matches the total listed in bold at the bottom.

Should differences in the database and lab sheet data be encountered, contact the BURP coordinator, then the Program Contractor, and finally the contracting Lab so that the appropriate corrections can be made. Written notification should be sent to the regional BURP coordinator of all changes and actions made to the data.

Division of Environmental Quality Macroinvertebrate Data Sheet

ID, Lemhi Co., Gant Creek

1998SIDFB086

T22N R18E S23 NE SW SW Elev. 1209m

07/27/1998, P.Fluckiner

Lab Name: EcoAnalysts, Inc.

Sorter: John Forbes

Taxonomist: Scott Lindstrom

Date into lab: 4/13/1999

Grids sorted: 20 / 20

Signature: SWL

Date Reported: 9/15/1999

Date Sorted: 7/1/1999

ID Date: 08/20/1999

Order	Taxon	Taxon Code	Total No.	Note
Ephemeroptera	Ameletus sp.	13	1	
	Baetis bicaudatus	18	5	
	Baetis tricaudatus	20	3	
	Epeorus longimanus	31	1	
	Ephemerella inermis/infrequens	616	3	
	Paraleptophlebia sp.	63	9	
Plecoptera	Doroneuria sp.	110	8	
	Malenka sp.	83	7	
	Sweltsa sp.	134	2	
	Visoka cataractae	87	1	
	Yoraperla sp.	74	32	
	Zapada columbiana	90	5	
Trichoptera	Neothremma sp.	229	5	
	Parapsyche elsis	195	2	
	Rhyacophila narvae	166	7	
	Rhyacophila sp.	153	1	immature
Coleoptera	Heterlimnius sp.	262	8	
Diptera	Simulium sp.	303	3	
Chironomidae (family)	Eukiefferiella claripennis gr.	348	1	
	Eukiefferiella coerulescens gr.	1,005	1	
	Eukiefferiella gracei gr.	350	1	
	Rheotanytarsus sp.	401	2	
	Thienemanniella sp.	908	1	
Oligochaeta (class)	Enchytraeidae	935	52	
Lumbricina	Lumbricina	786	3	
Ostracoda	Ostracoda	442	4	
Acari (subclass)	Acari	453	1	
Tricladida	Polycelis coronata	619	4	

Taxa Richness: 28

Total: 173

6

Auditing Fish Forms

The BURP crews (or other authorized personnel) capture fish at selected BURP sites. The length and total number of species and individuals is estimated and recorded in the field. They will also typically voucher a representative of each species and any fish with anomalies. The vouchers are sent to a professional taxonomist for positive identification and the results are sent to the State Office. In the meantime, we will have received from the Regional Office their fish field forms containing the header information, field comments, and vouchered as well as non-vouchered fish information.

The tracking and auditing procedure is as follows:

Field Form Accounting

- Stamp the date received on all the forms. The forms from the lab will usually have different dates than the forms from the regions.
- At least four pages are necessary per site: A header page, a fish collection data form, a page for size class information and the voucher sheet with the taxonomist's signature. Staple the pages in this order. Sometimes duplicates are received. These are not necessary to keep and can be recycled. Any extraneous pages, such as copies of crew notebooks, can also be recycled as long as all information on those pages is on the four kept pages. Some crews attach a map pinpointing their location. Staple it to the back of the forms. This is evidence of their location.
- Enter a group of fish forms ("batch") onto one of the sheets on the "Lab Analysis Tracking Sheet" clipboard. Try not to make the batches more than 22 forms, the number of lines on the tracking sheet. Attach a **blue** cover sheet on the batch and fill out the information on it.
- The batch is now ready to be QA checked:

Data Entry Form Completion

- A "DEQ Fish Data Entry Form" is needed for every fished site.
- Fill out the site ID, waterbody, date, pass number, and effort at the top of the form for a site, taking the information from the field form header. **NOTE: The year of the site ID might not equal the date collected. For example, 93SWIROA03 may have been collected in 1997.**

The following section explains how to fill out the taxa code, specimen identification confidence, and size class information. **Beware that each crew of each region has filled out their fish forms slightly differently.** The info should all be there, but sometimes needs more in-depth examination.

Step 1:

- Decide on a species to work with. Follow the procedure for each species at a site. As an example, rainbow trout, *Oncorhynchus mykiss*, taxa code 10, will be used. All fish and their respective taxa codes are on the DEQ Fish List.
- For this example, 20 rainbows were caught and 5 were vouchered. In the paperwork for the site, there should be length (and sometimes weight) measurements for all the taxa code 10 and a “fish collection data form” which shows which fish were vouchered.

Step 2:

- Label the column on the “DEQ Fish Data Entry Form”. At the top of the first column, write a “10”, the species code for trout, followed by a “/” and the confidence level of the person who identified the fish:
 - **Confidence levels are A, B, C, or D as follows:**
 - A: 95%.** Bona fide fish taxonomist on field crew and/or representative of all species vouchered and taxonomy done by a bona fide fish taxonomist. Taxonomist must be identified. No visual estimates.
 - B: 90%.** Experienced, full time fisheries biologist on collection crew and/or only some of the species vouchered and taxonomy done by a bona fide fish taxonomist. Fisheries biologist and taxonomist must be identified. No visual estimates.
 - C: >80%.** Crew made up of individuals familiar with species. At least one crew member must be identified. Species were not vouchered. No visual estimates.
 - D: < or = 80%.** No confidence or confidence unknown. May be due to such things as: 1) taxonomist, fisheries biologist, or crew members unknown; 2) visual estimates only; 3) poor specimen condition.
- The top of the column should look like this: 10/A

Step 3:

- Next, put tickmarks in the proper length categories for each fish that was identified and measured by the lab. Total the number of ticks and write that total in the box with the tickmarks. Circle the total. At the bottom of the column, record and circle the total number of fish that were vouchered.

- Determine if the vouchered fish were inclusive or exclusive of the counts of non-vouchered fish. This can be done by comparing totals of fishes in each species and/or by comparing lengths of fishes.
- The next column of the “DEQ Fish Data Entry Form” is going to be used for taxa code 10's that weren't vouchered. Write a “10” followed by a “/” and the confidence (which is usually “D” because the crews generally aren't fish taxonomists or experienced, full-time fisheries biologists): 10/D.
- Put tickmarks in the appropriate length categories for each fish, sum the tickmarks and circle the totals. At the bottom of the column, record and circle the total number of fish that were not vouchered.
- Sometimes the crews don't measure the fish, i.e. when 134 Redside shiners, taxa code 40, between 30mm and 50mm were caught. In this case, write the total at the bottom of the column and write 134 “no lengths” vertically in the column.
- The sum of the two columns regarding rainbow trout, taxa code 10, should equal the total number of fish caught. i.e., vouchered fish + released fish = total fish caught. Double check the total number of fish on the “DEQ Fish Data Entry Form” with the totals from the field sheets.
- Occasionally the taxonomist makes remarks about the fish on his form. Next to the checkmark on the “DEQ fish data entry form” for the fish with the remark, an abbreviation of the remark must be written and circled. These remarks need to be noted with the following abbreviations:
 - a: Anomalies. Usually black spot disease, other diseases, or lesions
 - j: Juveniles
- Repeat the procedure for each species at that site.
- Sometimes the crews note the number of tadpoles and other animals they see in the water. These should not be added to the “DEQ Fish Data Entry Form” since they are not fish.
- When all the fish species are accounted for, the “DEQ Fish Data Entry Form” should be stapled to the front of the other four pages regarding that site.

Form Reconciliation

It might very well happen that mistakes are made and not “caught” the same year. This section details how to reconcile errors in a uniform protocol.

- Using the signed voucher form, check to see that all vouchered species are listed in the proper length category. Also make sure all juveniles and anomalies are properly marked.
- Using the Fish Collection Record (with size class and total # released fish) check that all fish are accounted for and total counts correspond.
- If the error isn’t obvious by this point and hasn’t been corrected, override the previous Data Entry Form and start over. Most often it is easier to ignore a confusing sheet than try and figure it out.
- If unsure that the new Data Entry Form is correct, check with the BURP fish expert in the State Office.

Sometimes the fish are misidentified on the field form the crew submits. **Always group misidentified fish according to the identification given by the certified taxonomist.** For example, if the crew records 17 rainbow trout (taxacode 10) and no other *Oncorhynchus* spp., whereas the taxonomist identifies 9 of those 17 as cutthroat trout (taxacode 11) **it would be correct to label the two columns of vouchered and non-vouchered fish as 11/A and 11/D, NOT 11/A and 10/D.**

The Five Pages Necessary for a Fished Site to be Complete:

- Data Entry Form
- Header Sheet
- Fish Collection Data Form
- Size Classification Sheet
- Lab Sheet with Taxonomist's Signature

DEQ Fish Collection Record (pass 1 of 1, effort 119, seconds)

Length (mm)	Taxa code/ID confidence					
10-19	11 / A	21 / A	70 / A	21 / D	11 / D	96 / D
20-29						
30-39						(14)
40-49						(118)
50-59	(2)	(5)				(44)
60-69				(2)	3g	(58)
70-79						(30)
80-89						(20)
90-99			(1)			(7)
100-109						(3)
110-119	(1)	(1)			(1)	10g (1)
120-129				(2)	22g	
130-139						
140-149						
150-159				(3)	32g	
160-169						
170-179				(3)	60g	
180-189						
190-199				(2)	70g	
200-209						
210-219				(2)	130g	
220-229				(1)	130g	
230-239				(1)	130g	
240-249						
250-259						
260-269						
270-279						
280-289						
290-299						
300-309						
310-319						
320-329						
330-339						
340-349						
350-359						
360-369						
370-379						
380-389						
390-399						
400-409						
410-419						
420-429						
430-439						
440-449						
Total	(1)	(3)	(1)	(16)	(1)	(295)

Division of Environmental Quality Fish Data Sheet						
Field Information - Shaded areas must be completed before submittal of sample						
DEQ Project Code	8	1	-	9	1	004P00 - BRP - 3015
Name of Water Body	Bumblebee Creek (Lower)			Site ID N°:	96N1R00B24	
Location Description: permanent Landmarks	Reach begins 100 ft. downstream from road bridge					
Station or subsample N°:	County:	Township	Range:	Section:	Quarter:	
Lower	GoShone	50N	01E	25	NW, SE, SE	
Elevation:	Collector(s) First (or initial) & Last Names(s):				Sample Method:	
2400 FT	M. Enders, N. Koltz, M. Paul				Electrofishing	
Collection date (YY/MM/DD)	Reach Length:		Avg. Reach Width:			
97/07/17	115 M		3.5 M			
Field Taxonomist:	Temperature:		Conductivity:			
M. Enders	16°C		600 µMHO			
Identifying Lab Information:			A0897-2309 AQUATIC			
Lab Name:	Date Into Lab:		Date Reported:			
Taxonomist (First Initial & Last Name):			Remarks:			
Taxa Vouchered:						
Anomalies Noted:						
Equipment Settings:						
T4 - 600						
Species Stocked in last 5 years (note year)						
Field Comments:						

Stream Name: Bumblebee Creek (Lower) Site ID N°: 96N1R00B24 Date: 97, 07, 17

1997 Beneficial Use Reconnaissance Project Field Forms, Idaho Division of Environmental Quality

[illegible]

Fish Collection Data Form Adapted from DEQ Protocol #6. * see 1996 training manual for updated codes ** Fish confidence Codes: A (99.9%) - Must have fisheries taxonomist on collection crew or entire sample preserved and taxa work done by fisheries taxonomist (no visual estimate), B (99%) - Must have an experienced fisheries biologist on collection crew, or only part of sample preserved, (90%) - Crew made up of individuals familiar with species, D (<90%) - No confidence or confidence unknown. *** Anomalies include parasites, deformities, frayed fins, etc.

Stream Name: Bumblebee Creek (Lower) Site ID No: 96N1R0P824 Date: 97, 07, 17

Environmental Quality

DEQ Fish Collection Record (Pass 1 of 1, effort 1196 seconds)

Total Length (mm)	Taxa Code/ID Confidence					
	Brexitout	Cutthroat	Sculpin	Sculpin	Sculpin	Tadpoles
10-19				↓	↓	3φ
20-29						
30-39			III			
40-49			III	III	III	III
50-59	II	3g	III	III	III	
60-69	II	3g	III	III	III	
70-79			III			
80-89			III			
90-99			III			
100-109	I	IIg	III			
110-119		II	1φg	I		
120-129	II	2Lg				
130-139						
140-149						
150-159	III	32g				
160-169						
170-179	III	69g				
180-189						
190-199	II	70g				
200-209						
210-219	II	130g				
220-229	I	130g				
230-239	I	130g				
240-249						
250-259						
260-269						
270-279						
280-289						
290-299						
≥300 mm						

Stream Name: Bumblebee Creek Site ID No: 96NIRO0324 Date: 97, 07, 17
(Lower)

**1997 Beneficial Use Reconnaissance Project Field Forms, Idaho Division of
Environmental Quality
Division of Environmental Quality Fish Voucher Data Sheet**

Lab Name: EcoAnalysts, Inc.

Date into Lab: 9/ 2/97

Taxonomist: Dr. Richard Wallace

Stream name: Bumblebee Cr

Site ID No: 96NIRO0B24

Date: 17 July 1997

APU

[illegible]

Acknowledgments

The Beneficial Use Reconnaissance Project QA/QC Manual has evolved since 1995 into its present form. Many people have contributed to the effort since the first draft.

This manual was assembled by the Beneficial Use Reconnaissance Project Technical Advisory Committee (Cynthia Barrett, Bill Clark, Bryan Horsburgh, Dave Hull, Clyde Lay, Angie Peterson, Glen Pettit, Steve Robinson, Jack Skille, Daniel Stewart, and Bob Steed), Clyde Lay and Sean Woodhead edited the first draft of this manual, and Bill Clark, Morgan Cole, and Bryce England edited the final draft. Barry Burnell, Micheal Edmondson, and Don Zaroban provided critical review comments.

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Appendix A: Official DEQ Public Land Survey Locator Template

OFFICIAL D.E.Q. P.L.S.S. LOCATOR TEMPLATE

A Normal Section

NW4NW4	NE4NW4	NW4NE4	NE4NE4
SW4NW4	SE4NW4	SW4NE4	SE4NE4
NW4SW4	NE4SW4	NW4SE4	NE4SE4
SW4SW4	SE4SW4	SW4SE4	SE4SE4



A Wide Section

NW4NW4	NE4NW4	NW4NE4	NE4NE4
SW4NW4	SE4NW4	SW4NE4	SE4NE4
NW4SW4	NE4SW4	NW4SE4	NE4SE4
SW4SW4	SE4SW4	SW4SE4	SE4SE4



A Tall and Wide Section

NW4NW4	NE4NW4	NW4NE4	NE4NE4
SW4NW4	SE4NW4	SW4NE4	SE4NE4
NW4SW4	NE4SW4	NW4SE4	NE4SE4
SW4SW4	SE4SW4	SW4SE4	SE4SE4



A Tall Section

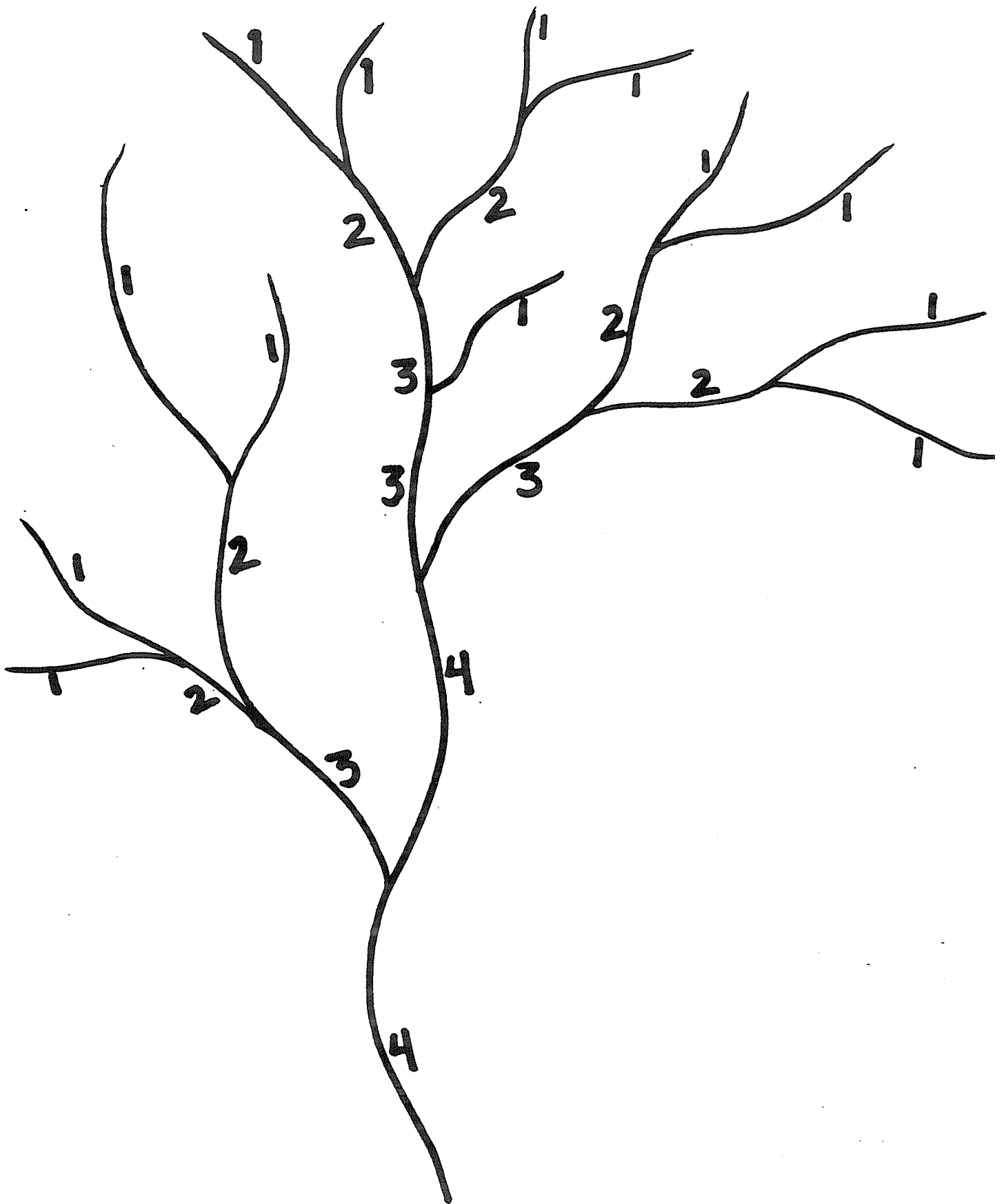
NW4NW4	NE4NW4	NW4NE4	NE4NE4
SW4NW4	SE4NW4	SW4NE4	SE4NE4
NW4SW4	NE4SW4	NW4SE4	NE4SE4
SW4SW4	SE4SW4	SW4SE4	SE4SE4



NOTE: Align the southeast corner of the template with the southeast corner of the section on the topographic map.

Appendix B: Guide to Stream Order Classification

Guide to Stream Order Classification



Appendix C: Field Form Checklist

FIELD FORM CHECKLIST

To ensure that the field forms are complete, please look over the following checklist before sending the forms to the State Office. Make sure that:

- The data on all pages of the photocopied field form is written legibly and can be seen clearly. If data is unreadable due to poor copy quality, please recopy the form on a darker setting.
- All fields have been completed with the required information.
- The seconds on the latitude/longitude measurement have been corrected and have decimal points in the right location.
- If only one set of photos was taken, copies have been made for the State Office.
- Page 3: The labels for the three macroinvertebrate samples are T1, T2, and T3.
- Page 4: If there was no LWD then zero has been entered in the field.
- Actual measurements have been recorded for the Wolman pebble count and Pool Quality Index. No “less than” or “greater than” symbols have been used as well as word descriptions such as “silt” or “sand”.
- The map on the last page has stream name, quad name, scale and site I.D. labeled on it.
- The Longitudinal Habitat Distribution (LHD) is equal to the reach length recorded on the cover page.

Appendix D: Idaho DEQ Fish Taxa Codes

Ftaxacode	Common name	Scientific name
1	Pacific lamprey	<i>Lampetra tridentata</i>
2	white sturgeon	<i>Acipenser transmontanus</i>
3	American shad	<i>Alosa sapidissima</i>
4	lake whitefish	<i>Coregonus clupeaformis</i>
5	chum salmon	<i>Oncorhynchus keta</i>
6	coho salmon	<i>Oncorhynchus kisutch</i>
7	sockeye salmon	<i>Oncorhynchus nerka</i>
8	kokanee	<i>Oncorhynchus nerka</i>
9	chinook salmon	<i>Oncorhynchus tshawytscha</i>
10	rainbow trout	<i>Oncorhynchus mykiss</i>
11	cutthroat trout	<i>Oncorhynchus clarki</i>
12	Bear Lake whitefish	<i>Prosopium abyssicola</i>
13	pygmy whitefish	<i>Prosopium coulteri</i>
14	Bonneville cisco	<i>Prosopium gemmifer</i>
15	Bonneville whitefish	<i>Prosopium spilonotus</i>
16	mountain whitefish	<i>Prosopium williamsoni</i>
17	golden trout	<i>Oncorhynchus aguabonita</i>
18	Atlantic salmon	<i>Salmo salar</i>
19	brown trout	<i>Salmo trutta</i>
20	Arctic char	<i>Salvelinus alpinus</i>
21	brook trout	<i>Salvelinus fontinalis</i>
22	bull trout	<i>Salvelinus confluentus</i>
23	lake trout	<i>Salvelinus namaycush</i>
24	Arctic grayling	<i>Thymallus arcticus</i>
25	rainbow smelt	<i>Osmerus mordax</i>
26	northern pike	<i>Esox lucius</i>
27	chiselmouth	<i>Acrocheilus alutaceus</i>
28	goldfish	<i>Carassius auratus</i>
29	lake chub	<i>Couesius plumbeus</i>
30	common carp	<i>Cyprinus carpio</i>
31	Utah chub	<i>Gila atraria</i>
32	tui chub	<i>Gila bicolor</i>
33	leatherside chub	<i>Gila copei</i>
34	peamouth	<i>Mylocheilus caurinus</i>
35	fathead minnow	<i>Pimephales promelas</i>
36	northern squawfish	<i>Ptychocheilus oregonensis</i>
37	longnose dace	<i>Rhinichthys cataractae</i>
38	leopard dace	<i>Rhinichthys falcatus</i>
39	speckled dace	<i>Rhinichthys osculus</i>
40	reidside shiner	<i>Richardsonius balteatus</i>
41	tench	<i>Tinca tinca</i>
42	Utah sucker	<i>Catostomus ardens</i>
43	longnose sucker	<i>Catostomus catostomus</i>
44	bridgelip sucker	<i>Catostomus columbianus</i>
45	bluehead sucker	<i>Catostomus discobolus</i>
46	largescale sucker	<i>Catostomus macrocheilus</i>

Fltaxacode	Common name	Scientific name
47	mountain sucker	<i>Catostomus platyrhynchus</i>
48	black bullhead	<i>Ameiurus melas</i>
49	brown bullhead	<i>Ameiurus nebulosus</i>
50	channel catfish	<i>Ictalurus punctatus</i>
51	tadpole madtom	<i>Noturus gyrinus</i>
52	flathead catfish	<i>Pylodictis olivaris</i>
53	sand roller	<i>Percopsis transmontana</i>
54	burbot	<i>Lota lota</i>
55	western mosquitofish	<i>Gambusia affinis</i>
56	guppy	<i>Poecilia reticulata</i>
57	green sunfish	<i>Lepomis cyanellus</i>
58	pumpkinseed	<i>Lepomis gibbosus</i>
59	warmouth	<i>Lepomis gulosus</i>
60	bluegill	<i>Lepomis macrochirus</i>
61	smallmouth bass	<i>Micropterus dolomieu</i>
62	largemouth bass	<i>Micropterus salmoides</i>
63	white crappie	<i>Pomoxis annularis</i>
64	black crappie	<i>Pomoxis nigromaculatus</i>
65	yellow perch	<i>Perca flavescens</i>
66	walleye	<i>Stizostedion vitreum</i>
67	mottled sculpin	<i>Cottus bairdi</i>
68	Paiute sculpin	<i>Cottus beldingi</i>
69	slimy sculpin	<i>Cottus cognatus</i>
70	shorthead sculpin	<i>Cottus confusus</i>
71	Bear Lake sculpin	<i>Cottus extensus</i>
72	Shoshone sculpin	<i>Cottus greenei</i>
73	Wood River sculpin	<i>Cottus leiopomus</i>
74	torrent sculpin	<i>Cottus rhotheus</i>
75	lamprey	<i>Lampetra sp.</i>
76	sturgeon	<i>Acipenseridae sp.</i>
77	whitefish	<i>Coregonus sp.</i>
78	Pacific salmon/trout (<i>Oncorhynchus sp.</i>)	<i>Oncorhynchus sp.</i>
79	whitefish	<i>Prosopium sp.</i>
80	Atlantic salmon/trout (<i>Salmo sp.</i>)	<i>Salmo sp.</i>
81	char	<i>Salvelinus sp.</i>
82	grayling	<i>Thymallus sp.</i>
83	pike	<i>Esox sp.</i>
84	chub (<i>Couesius sp.</i>)	<i>Couesius sp.</i>
85	chub (<i>Gila sp.</i>)	<i>Gila sp.</i>
86	squawfish	<i>Ptychocheilus sp.</i>
87	dace	<i>Rhinichthys sp.</i>
88	shiner	<i>Richardsonius sp.</i>
89	sucker	<i>Catostomus sp.</i>
90	catfish	<i>Ictalurus sp.</i>
91	trout-perch	<i>Percopsis sp.</i>
92	sunfish	<i>Lepomis sp.</i>

Flaxacode	Common name	Scientific name
93	bass	<i>Micropterus sp.</i>
94	crappie	<i>Pomoxis sp.</i>
95	perch	<i>Perca sp.</i>
96	sculpin	<i>Cottus sp.</i>
97	herring	<i>Clupeidae</i>
98	trout (Salmonidae)	<i>Salmonidae</i>
99	minnow	<i>Cyprinidae</i>
100	catfish (Ictaluridae)	<i>Ictaluridae</i>
101	guppy	<i>Poeciliidae</i>
102	sunfish	<i>Centrarchidae</i>
103	perch (Percidae)	<i>Percidae</i>
104	bullhead (Ameiurus sp.)	<i>Ameiurus sp.</i>
105	cod	<i>Lota sp.</i>
106	smelt	<i>Osmerus sp.</i>
107	oriental weatherfish	<i>Misgurnus anguillicaudatus</i>
108	weatherfish	<i>Misgurnus sp.</i>
109	loach (Cobitidae)	<i>Cobitidae</i>
110	convict cichlid	<i>Cichlasoma nigrofasciatum</i>
111	blue tilapia	<i>Tilapia aurea</i>
112	Mozambique tilapia	<i>Tilapia mossambica</i>
113	redbelly tilapia	<i>Tilapia zilli</i>
114	shortfin molly	<i>Poecilia mexicana</i>
115	green swordtail	<i>Xiphophorus helleri</i>
116	yellow bullhead	<i>Ameiurus natalis</i>
117	steelhead	<i>Oncorhynchus mykiss</i>
118	grass carp	<i>Ctenopharyngodon idella</i>
119	spottail shiner	<i>Notropis hudsonius</i>
120	blue catfish	<i>Ictalurus furcatus</i>
121	platy	<i>Xiphophorus sp.</i>
122	sauger	<i>Stizostedion canadense</i>
123	American shad	<i>Alosa sapidissima</i>
124	Umpqua dace	<i>Rhinichthys evermanni</i>
501	cutthroat trout (all stocks) X rainbow trout	<i>Oncorhynchus clarki</i> X <i>O. mykiss</i>
502	brook trout X bull trout	<i>Salvelinus fontinalis</i> X <i>S. confluentus</i>
503	brook trout X lake trout (splake)	<i>Salvelinus fontinalis</i> X <i>S. namaycush</i>
504	brook trout X brown trout (tiger trout)	<i>Salvelinus fontinalis</i> X <i>Salmo trutta</i>
505	tiger muskellunge	<i>Esox lucius</i> X <i>E. masquinongy</i>
9999	fish	unidentified